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(Date of Deposit)

Date 9/9/02  
By Michael J. P.

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of )  
Kawaguchi, et al. )  
Serial No. 09 / 806,653 ) Art Unit: 2876  
Filed: July 23, 2001 ) Examiner: St. Cyr, Daniel  
For: INFORMATION CARD AND )  
INFORMATION CARD SYSTEM )

**DECLARATION UNDER 37 C.F.R. §1.132 OF KYOKI IMAMURA**

Assistant Commissioner for Patents  
Washington, D.C., 20231

Sir:

1. My name is Kyoki Imamura, of Kyushu, Japan. I declare that I am a Professor of the Faculty of Computer Science and Systems Engineering at Kyushu Institute of Technology in Kyushu, and that the attached personal data sheet is an accurate reflection of my credentials.
2. I declare that I am one of at least ordinary skill in the arts of coding theory, cryptography and information security, pseudorandom sequence, computation in finite fields, and complexity of sequences.
3. I declare that I have read the above referenced patent application, including the claims as amended, the Official Action, and the Rhoads reference cited by the Examiner.
4. I declare that methods disclosed in the Rhoads reference are primarily directed to the authentication of the identity of a signal, computer file, image, card, or the like. I further declare that, based upon the teachings of Rhoads, I would have no motivation to modify the Rhoads methods to authenticate that the holder of such a signal, computer file, image or card is the rightful owner.

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5. I declare that the card disclosed in the Rhoads reference does not provide any authentication that the user of the card is the owner of the card and does not include any "output means for outputting the read information data", as claimed in the Applicant's claims 5 - 12. I further declare that, because the system disclosed in the Rhoads is specifically designed to avoid a transmission of the actual data, I would have no motivation to modify the system to include such an "output means".
6. I declare that the card system disclosed in the Rhoads reference must be used with a network terminal and may not be used in locations that do not have telecommunications access. I further declare that I would have no motivation to modify the system of Rhoads to obtain a "stand alone" system that simply utilizes the information hidden within the card to provide authentication of the user, as claimed by the Applicant.
7. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of any application or patent issuing thereon.

August 30, 2002  
Date

Kyoki Imamura  
Kyoki Imamura



## KYOKI IMAMURA

### Personal Data

- ADD FULL HOME ADDRESS
- Date of Birth: 5 March, 1951
- Date of Birth: 7th of March, 1943
- Citizen of the Republic of China

### Affiliation

- Kyushu Institute of Technology
- Professor; Faculty of Computer Science and System Engineering

### Educational Background

- March 1965, Bachelor of Engineering, Kyushu University, Fukuoka, Japan,
- March 1967, Master of Engineering, Kyushu University, Fukuoka, Japan,
- March 1970, quitting from Doctor course of Engineering, Kyushu University, Fukuoka, Japan

### Academic Awards

- March 1975, Yonezawa Prize, Institute of Electronics and Communication Engineers, Japan,
- September 1997, Visiting Professor, Xidian University, Xi'an, P.R. China

### Academic Degree

- Doctor of Engineering (Kyushu University)

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### Professional Career

- April 1970, Research Associate, Fac. of Engineering, Kyushu University, Fukuoka, Japan,
- April 1972, Associate Professor, Fac. of Science and Engineering, Saga University, Saga, Japan,
- April 1987, Professor, Fac. of Computer Science and Systems, Kyushu Institute of Technology, Iizuka, Japan

### Academic Organization Membership

- IEEE
- The Institute of Electronics, Information and Communication Engineers
- Society of Information Theory and Its Applications

### Other Academic Activities

- Program Committee Co-Chairman of Pacific Rim Workshop on Digital Steganography, 2002, (2002)
- Chairman of Japan Chapter of IEEE Information Theory Society, (2000, 2001)
- Chairman of SITA 2000 (2000 Symposium on Information Theory and its Applications), (2000)
- Chairman of SCIS '97 (1997 Symposium on Cryptography and Information Security), (1997)
- Steering committee Member of IEICE, Kyushu Chapter (1996-1998)

### Courses currently in charge

- Electrical Circuit IE,
- Communication Theory,
- Digital Circuits

### Academic Field of Specialization

- coding theory

- cryptography and information security
- pseudorandom sequence

### Research Topics and Highlight of Publications

#### 1. *coding theory*

Analysis of error correcting capability and efficient decoding algorithm of error correcting codes

- Is Matsumoto's generalization of the Feng-Rao designed minimum distance for binary linear codes effective ?, Proc. of 6th International Symp. on DSP for Communication Systems, (2002), 84-87
- A simple derivation of the Berlekamp-Massey algorithm and some applications, IEEE Trans. on Information Theory, IT-33 (1987), 146-150
- On computation of the binary weight distribution of some Reed-Solomon codes and their extended codes, Proc. of International Colloq. on Coding Theory (1988), 195-204
- Relations between several minimum distance bounds of binary cyclic codes, IEICE Trans. on Fundamentals, E-80 (1997), 2253-2255

#### 2. *pseudorandom sequences*

Design and analysis of pseudorandom sequences useful for CDMA in spread spectrum communications

- Characteristic polynomials of binary Kronecker sequences, Proc. of Sequences and their Applications (2001), 310-318.
- Balanced quadriphase sequences with optimal periodic correlation properties constructed by real-valued bent functions, IEEE Trans. on Information Theory, 39 (1993), 305-310
- Balanced nonbinary sequences with good periodic correlation properties obtained from modified Kumar-Moreno sequences, IEEE Trans. on Information Theory, 41 (1995), 572-576
- On p-ary bent sequences, IEICE Trans. on Fundamentals, E78-A (1995), 1257-1260

### 3. *Complexity of sequences*

#### Analysis of randomness of pseudorandom sequences

- Linear complexity of a sequence obtained from a periodic sequence by either substituting, inserting, or deleting  $k$  symbols within one period, IEEE Trans. on Information Theory, 46 (2000), 1174-1177.
- Linear complexity for one-symbol substitution of a periodic sequence over  $GF(q)$ , IEEE Trans. on Information Theory, 44 (1998), 1328-1331
- Maximum order complexity for the minimum changes of an  $m$ -sequence, IEICE Trans. on Fundamentals, E81-A (1998), 2407-2411
- Partial realization, linear feedback shift register generation and the linear complexity of a sequence, Mathematical Theory of Networks and Systems (Proc. MTNS-98) (1999), 1031-1034 (invited paper)

### 4. *Cryptography and information security*

#### Theory of cryptographies and their applications

- An algorithm for the  $k$ -error linear complexity of sequences over  $GF(p^m)$  with period  $p^n$ ,  $p$  an odd prime, Information and Computation, 151 (1999), 134-147 (invited paper)
- The limited verifier signature and its applications, IEICE Trans. on Fundamentals, E82-A (1999), 63-68
- A spread-spectrum communication system protecting information data from interception, IEEE Trans. on Information Theory, 46 1691-1695, (2000).

### 5. *Applications of finite field arithmetics*

#### Analysis of structures of finite fields and their engineering applications

- A method for computing addition tables in  $GF(p^n)$ , IEEE Trans. on Information Theory, IT-26 (1980), 367-369
- Two classes of finite fields which have no selfcomplementary bases, Proc. IEEE ISIT'85 (International Symp. on Information Theory) (1985), 50
- The number of selfcomplementary bases of a finite field of characteristic two, Proc. IEEE ISIT'88 (International Symp. on Information Theory) (1988), 209-210

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of	)	
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Kawaguchi, et al.	)	
	)	Art Unit: 2876
Serial No. 09 / 806,653	)	Examiner: St. Cyr, Daniel
	)	
Filed: July 23, 2001	)	
	)	
For: INFORMATION CARD AND	)	
INFORMATION CARD SYSTEM	)	

**DECLARATION UNDER 37 C.F.R. §1.132 OF DR. MONGI ABIDI**

Assistant Commissioner for Patents  
Washington, D.C., 20231

Sir:

1. My name is Dr. Mongi A. Abidi, of Knoxville, Tennessee. I declare that I am an Professor and Associate Department Head in the Department of Electrical and Computer Engineering at the University of Tennessee at Knoxville and that the attached personal data sheet is an accurate reflection of my credentials.
2. I declare that I am one of at least ordinary skill in the arts of image processing, pattern recognition, computer vision, mathematical transforms, data fusion, fuzzy logic, and neural networks.
3. I declare that I have read the above referenced patent application, including the claims as amended, the Official Action, and the Rhoads reference cited by the Examiner.
4. I declare that methods disclosed in the Rhoads reference are primarily directed to the authentication of the identity of a signal, computer file, image, card, or the like. I further

declare that, based upon the teachings of Rhoads, I would have no motivation to modify the Rhoads methods to authenticate that the holder of such a signal, computer file, image or card is the rightful owner.

5. I declare that the card disclosed in the Rhoads reference does not provide any authentication that the user of the card is the owner of the card and does not include any "output means for outputting the read information data", as claimed in the Applicant's claims 5 - 12. I further declare that, because the system disclosed in the Rhoads is specifically designed to avoid a transmission of the actual data, I would have no motivation to modify the system to include such an "output means".
6. I declare that the card system disclosed in the Rhoads reference must be used with a network terminal and may not be used in locations that do not have telecommunications access. I further declare that I would have no motivation to modify the system of Rhoads to obtain a "stand alone" system that simply utilizes the information hidden within the card to provide authentication of the user, as claimed by the Applicant.
7. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of any application or patent issuing thereon.

Sept 3, 2002

Date

M. A. Abidi

Dr. Mongi A. Abidi



# **Dr Mongi A. Abidi**

The University of Tennessee  
328 Ferris Hall  
Knoxville, TN 37996-2100  
Telephone: (865) 974-5454  
Facsimile: (865) 974-5459  
E-mail: abidi@utk.edu

## Education

- Ph.D. in Electrical Engineering from The University of Tennessee, Knoxville, 1986
- Master's degree in Electrical Engineering from The University of Tennessee, Knoxville, 1984
- Principal Engineering degree in Electrical Engineering from the National Engineering School of Tunis, Tunisia, 1981.

## Experience

- Professor and Associate Department Head in the Department of Electrical and Computer Engineering,
  - Directs activities in the Imaging, Robotics, and Intelligent Systems Laboratory
  - Conducts research in the field of three-dimensional imaging, specifically in the areas of scene building, scene description, and data visualization.
  - Involved in the areas of robotic multisensing, landmark tracking and sensor calibration, data fusion and probabilistic reasoning, and enhancement of medical images.
  - Teaches senior and graduate courses at UTK in the fields of pattern recognition, image processing, computer vision, and robotics.
  - Developed three courses in image processing and robotics.
  - Taught industrial courses in the areas of mathematical transforms for engineers, data fusion, fuzzy logic, and neural networks.
- Principal investigator or co-principal investigator for research contracts totaling over \$16 million. Currently acting as principal investigator for three programs:
  - 3D Imaging and Data Fusion for Robotic Manipulation and Inspection, part of the DOE's multi-university Research Program in Robotics.
  - 3D Imaging and Data Fusion for Automotive Simulation and Design, part of a multi-university program with the U.S. Army TACOM.
  - Gate-to-Gate Automated Video Tracking and Location and Operator Assisted Threat Assessment for Carry-on Luggage Inspection, both with National Safe Skies.

### Professional Societies

- Tau Beta Pi
- Phi Kappa Phi
- Eta Kappa Nu
- Order of the Engineer

### Awards

- First State Award in primary graduation
- First State Award in secondary graduation
- First Presidential Principal Engineer Award
- 2002-2003 Dun & Bradstreet Who's Who in Executives and Business
- 2002 United Who's Who in Empowering Executives and Professionals
- 2002 Marquis Who's Who in America
- Strathmore's Lifetime Who's Who Award
- 2001-2003 Philips Professorship Award
- 2001 Science Alliance Faculty Award
- 2001 Brooks Distinguished Professor Award
- 1999-2001 Weston Fulton Professorship
- 1997-2000 Magnavox Professorship
- 1995 Chancellor's Award for Research and Creative Achievement

### Memberships

- IEEE Computer Society
- IEEE Institute of Electrical and Electronic Engineering
- IEEE Robotics and Automation Society
- Pattern Recognition Society
- Association of Computing Machinery
- International Society of Optical Engineering.

### Publications

- Author or co-author of over 150 publications in computer vision and robotics journals and conference proceedings
- Co-editor of the book Data Fusion in Robotics and Machine Intelligence, published by Academic Press in 1992
- Co-editor of the following book chapters:
  - Logical Combinatorial Pattern Recognition: A Review, Recent Research Developments in Pattern Recognition, Transworld Research Networks, 2002
  - Positron Emission Tomography: Image Filtering, Encyclopedia of Computer Science and Technology, Marcel Dekker, 1993
- A Regularized Solution to Multi-Dimensional Data Fusion, Data Fusion in Robotics and Machine Intelligence, Academic Press, 1992.



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By [Signature] 9/9/02

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of

Kawaguchi, et al.

Serial No. 09 / 806,653

Filed: July 23, 2001

For: INFORMATION CARD AND  
INFORMATION CARD SYSTEM )

Art Unit: 2876

Examiner: St. Cyr, Daniel

**DECLARATION UNDER 37 C.F.R. §1.132 OF HIDEKI NODA**

Assistant Commissioner for Patents  
Washington, D.C., 20231

Sir:

1. My name is Hideki Noda, of Kyushu, Japan. I declare that I am an Associate Professor of the Faculty of Engineering at Kyushu Institute of Technology in Kyushu and that the attached personal data sheet is an accurate reflection of my credentials.
2. I declare that I am one of at least ordinary skill in the arts of steganography information processing, image processing, pattern recognition, speech processing, and neural networks.
3. I declare that I have read the above referenced patent application, including the claims as amended, the Official Action, and the Rhoads reference cited by the Examiner.
4. I declare that methods disclosed in the Rhoads reference are primarily directed to the authentication of the identity of a signal, computer file, image, card, or the like. I further declare that, based upon the teachings of Rhoads, I would have no motivation to modify the Rhoads methods to authenticate that the holder of such a signal, computer file, image or card is the rightful owner.
5. I declare that the card disclosed in the Rhoads reference does not provide any authentication that the user of the card is the owner of the card and does not include any

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"output means for outputting the read information data", as claimed in the Applicant's claims 5 - 12. I further declare that, because the system disclosed in the Rhoads is specifically designed to avoid a transmission of the actual data, I would have no motivation to modify the system to include such an "output means".

6. I declare that the card system disclosed in the Rhoads reference must be used with a network terminal and may not be used in locations that do not have telecommunications access. I further declare that I would have no motivation to modify the system of Rhoads to obtain a "stand alone" system that simply utilizes the information hidden within the card to provide authentication of the user, as claimed by the Applicant.
7. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of any application or patent issuing thereon.

Aug. 30, 2002

Date

Hideki Noda

Hideki Noda



## HIDEKI NODA

### Personal Data

- ADD FULL HOME ADDRESS
- Date of Birth: 5 March, 1951
- Citizen of Japan

### Affiliation

- Kyushu Institute of Technology
- Associate Professor; Faculty of Engineering

### Educational Background

- Department of Electronics Engineering, Faculty of Engineering, Kyushu University, Bachelor of Engineering, 1973
- Department of Electronics Engineering, Graduate School of Engineering, Kyushu University, Master of Engineering, 1975

### Academic Degree

- Doctor of Engineering (Kyushu Institute of Technology)

### Professional Career

- Researcher, National Research Institute of Police Science, Japan National Police Agency, April 1978
- Researcher, Communications Research Laboratory, Japan Ministry of Posts and Telecommunications, April 1989
- Chief, Auditory and Visual Informatics Section, Communications Research Laboratory, Japan Ministry of Posts and Telecommunications, June 1990
- Associate Professor, Faculty of Engineering, Kyushu Institute of Technology, April 1995

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### Academic Organization Membership

- Institute of Electronics, Information and Communication Engineers
- Acoustical Society of Japan

### Courses currently in charge

- Computer Engineering Practice I
- Assembler Programming
- Pattern Recognition
- Advanced Recognition Systems

### Academic Fields of Specialization

- Information Processing
- Information Science

### Research Topics and Highlight of Publications

#### *1. Image Processing Using MRF*

- Markov random fields (MRF) is an noncausal Markov model suitable for modeling images. We are working on the MRF model-based image segmentation, image restoration, textured image recognition and stereo vision.
- MRF-based texture segmentation using wavelet decomposed images, Pattern Recognition, 35(4), (2002), 771-782
- Texture classification based on Markov modeling in wavelet feature space, Image and Vision Computing, 18, (2000), 967-973
- Mean field decomposition of a posteriori probability for MRF-based image segmentation: unsupervised multispectral textured image segmentation, IEICE Trans. Information & Systems, E82-D(12), (1999), 1605-1611
- Data-driven segmentation of multispectral images using hierarchical Markov random fields, Trans. IEICE: D-II, 80-D-II(9) (1997), 2278-2286
- Blind restoration of degraded binary Markov random field images, CVGIP: Graph. Models & Image Process., 58(1), (1996), 90-98

## 2. *Speech and Speaker Recognition*

- We are working on speech recognition (isolated uttered word recognition) using the hidden Markov model, and an adaptive speaker recognition (speaker identification and speaker verification) using statistical sequential decision.
- Adaptive speaker identification using sequential probability ratio test, Trans. IEICE: D-II, 84-D-II(1) (2001), 211-213
- A context-dependent sequential decision for speaker verification, IEICE Trans. Information & Systems, E82-D(10), (1999), 1433-1436
- A MRF-based parallel processing for speech recognition using linear predictive HMM, IEICE Trans. Information & Systems, E77-D(10) (1994), 1142-1147

## 3. *Feature Extraction and Pattern Classification Using Neural Networks*

- The Hebbian learning procedure is being investigated for the Principal Component Analysis to extract features, and a modular neural network investigated for pattern classification.
- Determination of principal components in data, Expert Systems (Edited by Cornelius T. Leondes), Academic Press, 4, (2001), 1199-1258
- Principal component analysis using one-unit linear neurons with inhibitory connections, IPSJ Journal, 39(11), (1998), 3146-3149
- A symmetric linear neural network that learns principal components and their variances, IEEE Trans. Neural Networks, 7(4) (1996), 1042-1047

## 4. *Steganography (Data Hiding)*

- Steganography is a new information security technology, different from the cryptography, to embed secret data into dummy data, resulting no evidence of existing secret perceived. We are working on a large capacity steganography using image and audio data as dummy data.
- BPCS steganography using EZW lossy compressed images, Pattern Recognition Letters, 23, (2002), 1579-1587

- Topological ordered color table for BPCS-steganography using indexed color images, IPSJ Journal, 42(1), (2001), 110-113
- A steganography based on region segmentation by using complexity measure, Trans. IEICE: D-II, 81-D-II(6) (1998), 1132-1140